Fig. 11 – OCN Turbo shaft Engine - Example

Net Power=630 kW; n_1=54,000 rpm; n_2=45,000 rpm
G=2.7 Kg/sec; Compressor P.R.=16; $T_{combustor}$=1260°K; Thermal Efficiency=35%

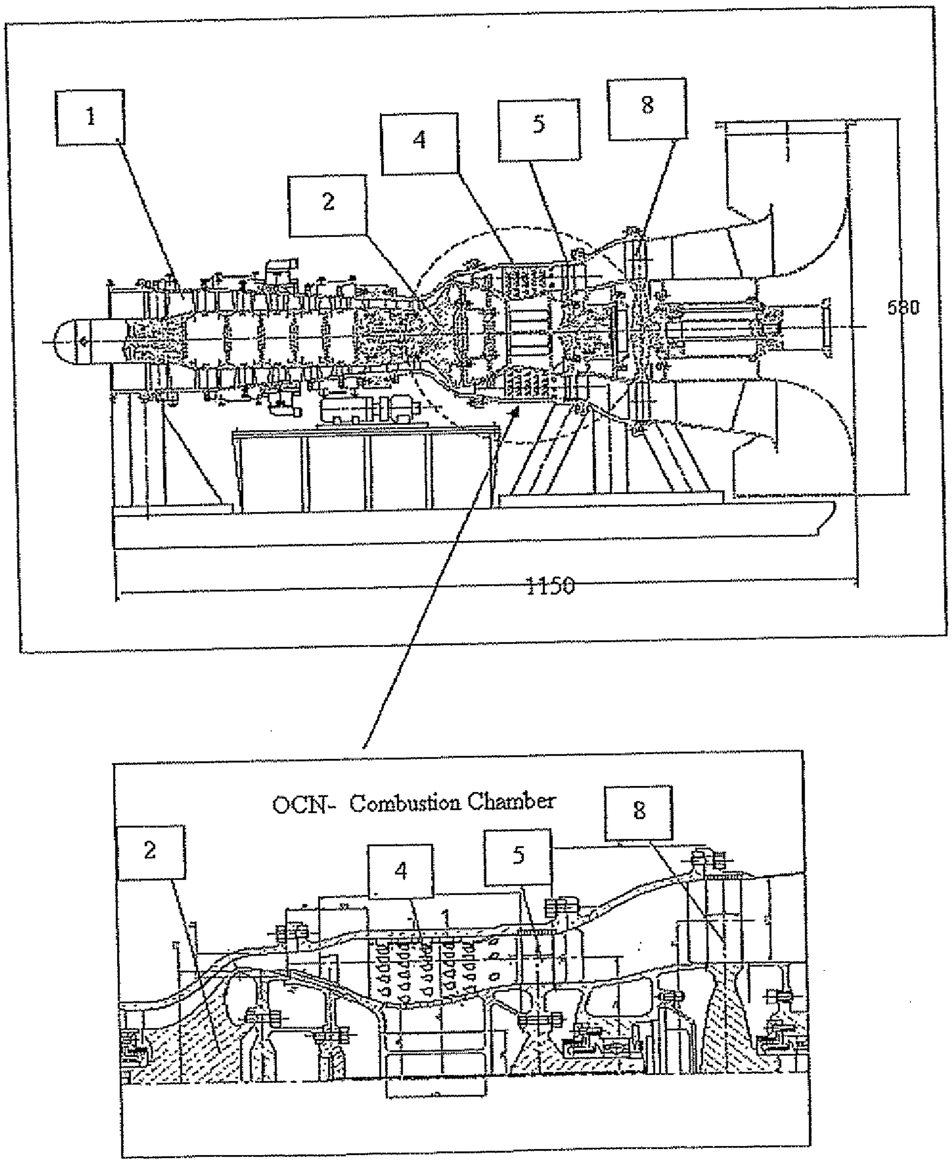
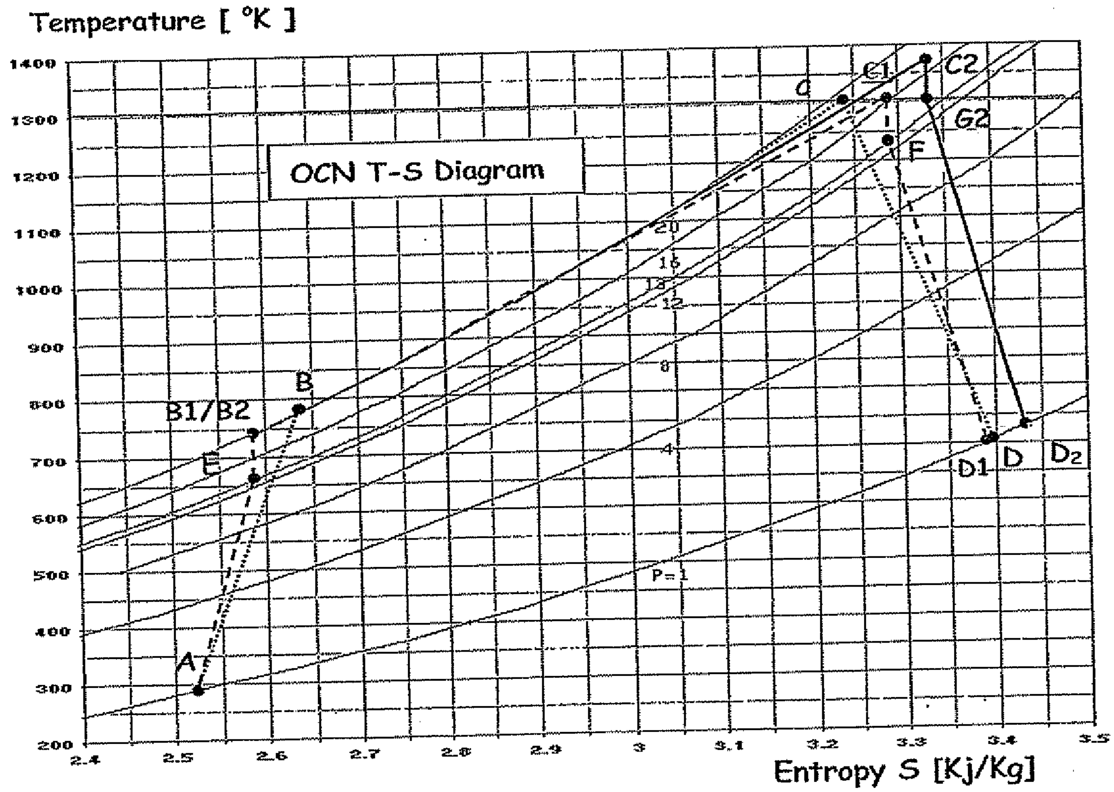


Fig. 12 - OCN T-S Diagram

line style	Cycles	Efficiency	Power	η_c	η_t
…………	Conventional = A-B-C-D	29%	181 kW	80%	87%
– – – – –	OCN, T_t=1300° K = A-E-B1-C1-F-D1	34%	210 kW	85%	92%
————	OCN, T_R=1300° K = A-E-B2-C2-G2-D2	35%	256 kW	85%	92%

Compressor P.R = 20; u = 500 m/sec; Cu = 400 m/sec.



	A	B	B1,B2	C	C1	C_2	D	D1	D2	E	F	G2
T °K	288	777	748	1300	1300	1370	707	702	731	668	1230	1300
P Bar	1	20	20	19.5	15.5	16	1	1	1	13	13	13

Fig. 13 O.C.N THERMAL EFFICIENCIES

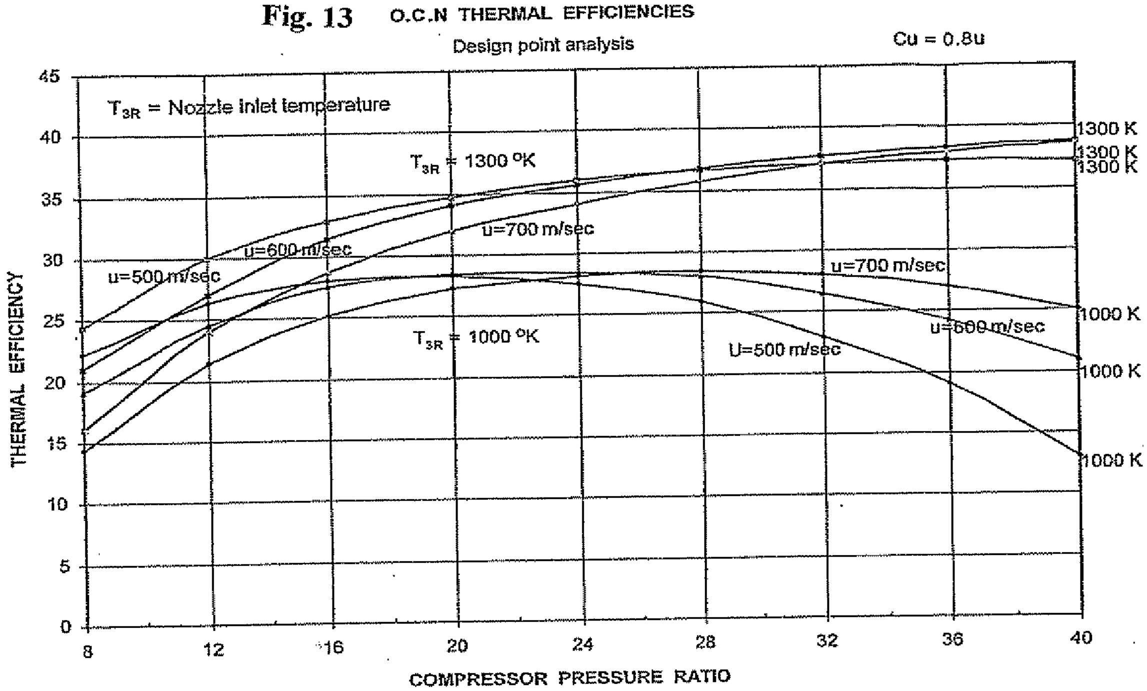


Fig. 14 O.C.N SPECIFIC POWER

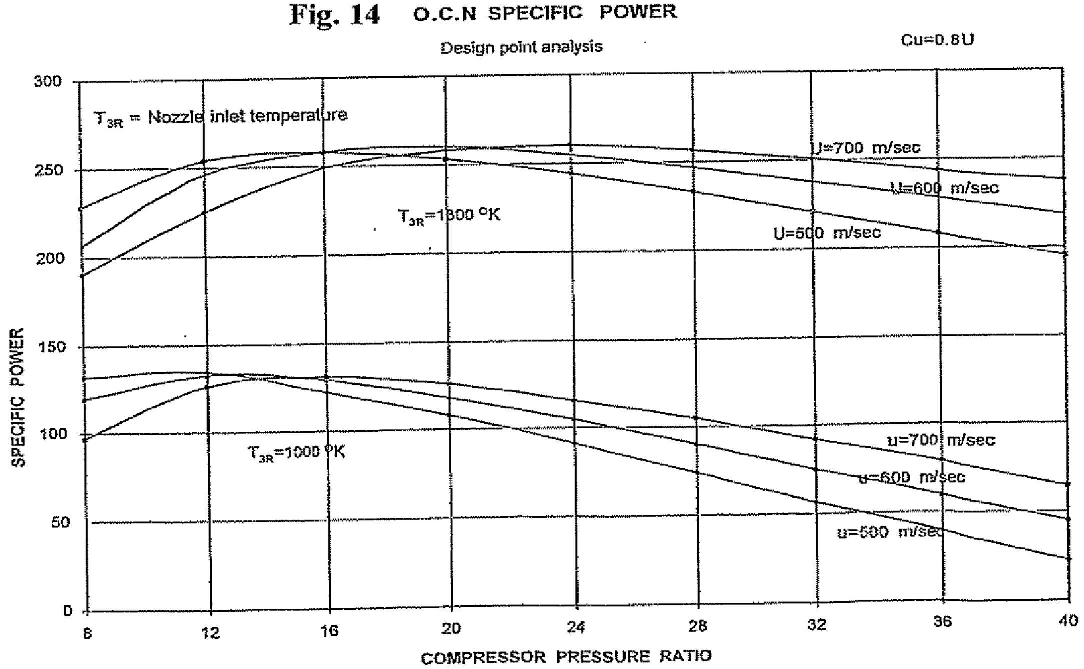


Fig. 15 - O.C.N AND CONVENTIONAL GAS TURBINE SPECIFIC POWER

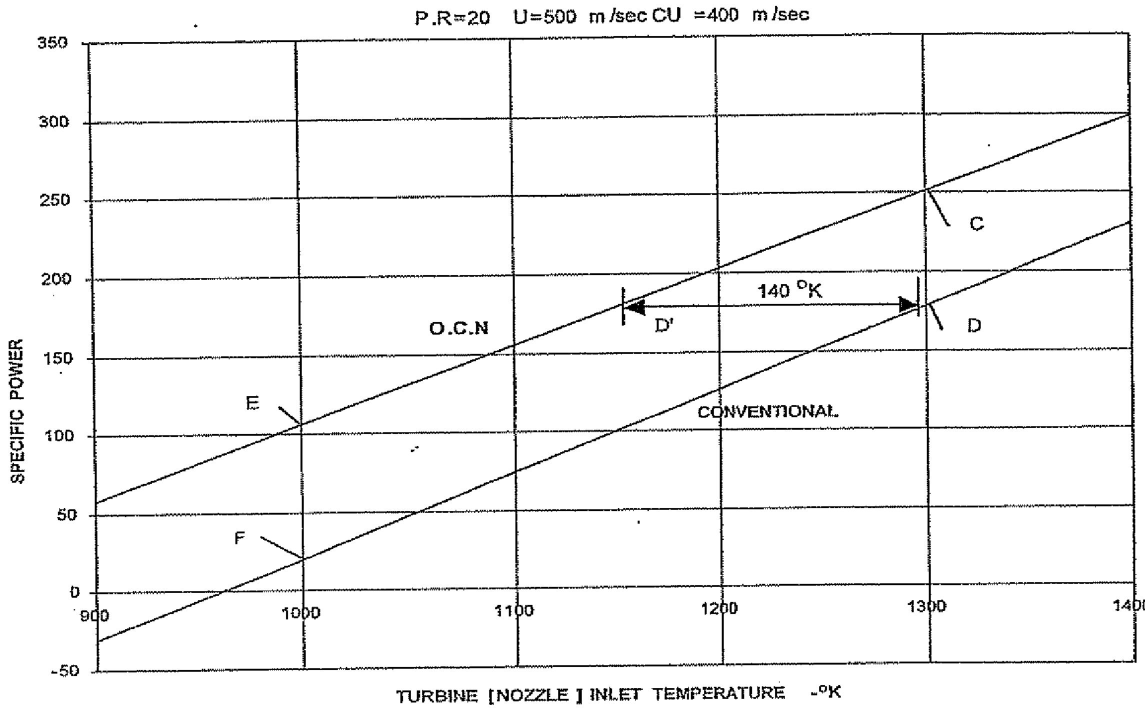


Fig. 16 - O.C.N AND CONVENTIONAL GAS TURBINE EFFICIENC

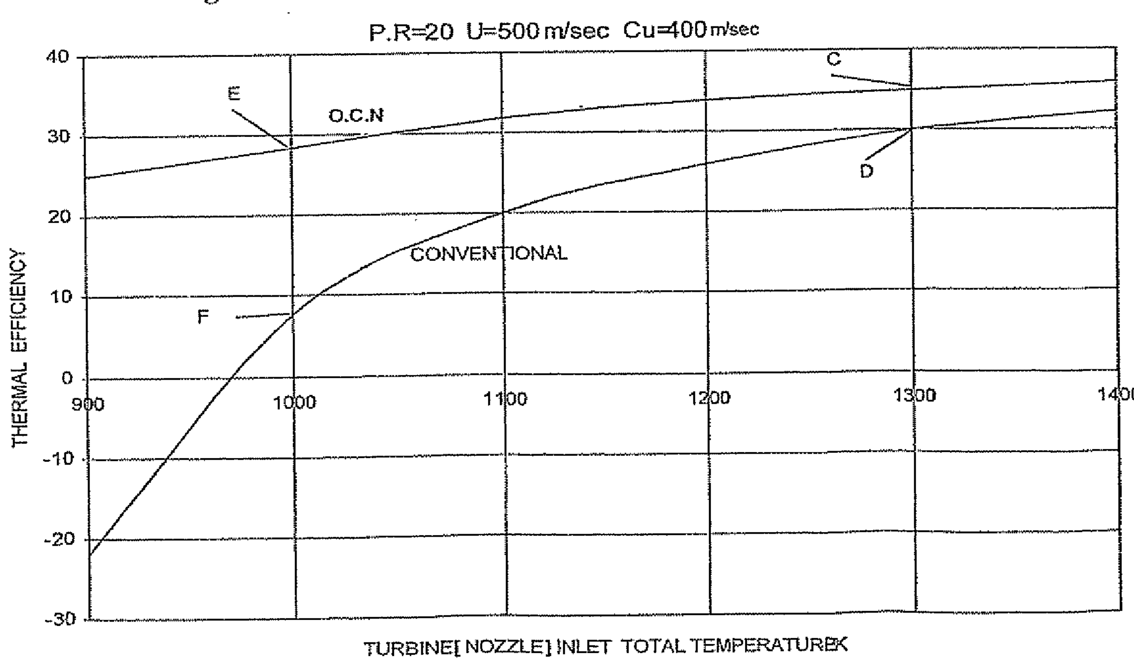


Fig. 17 O.C.N TURBOFAN S .F.C.

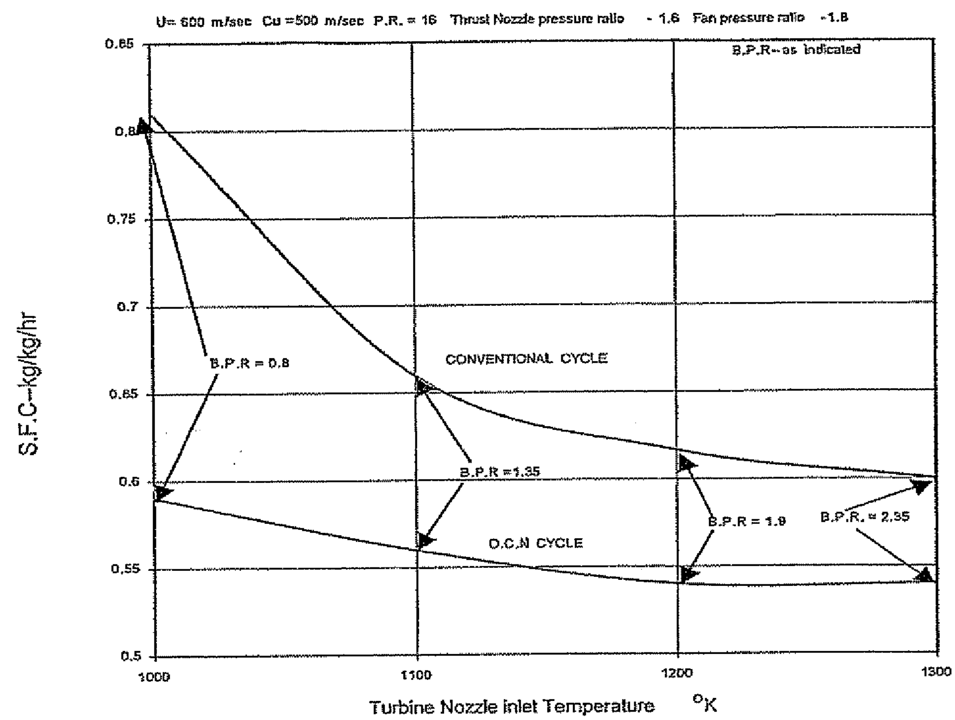


Fig. 18 O.C.N TURBOFAN THRUST

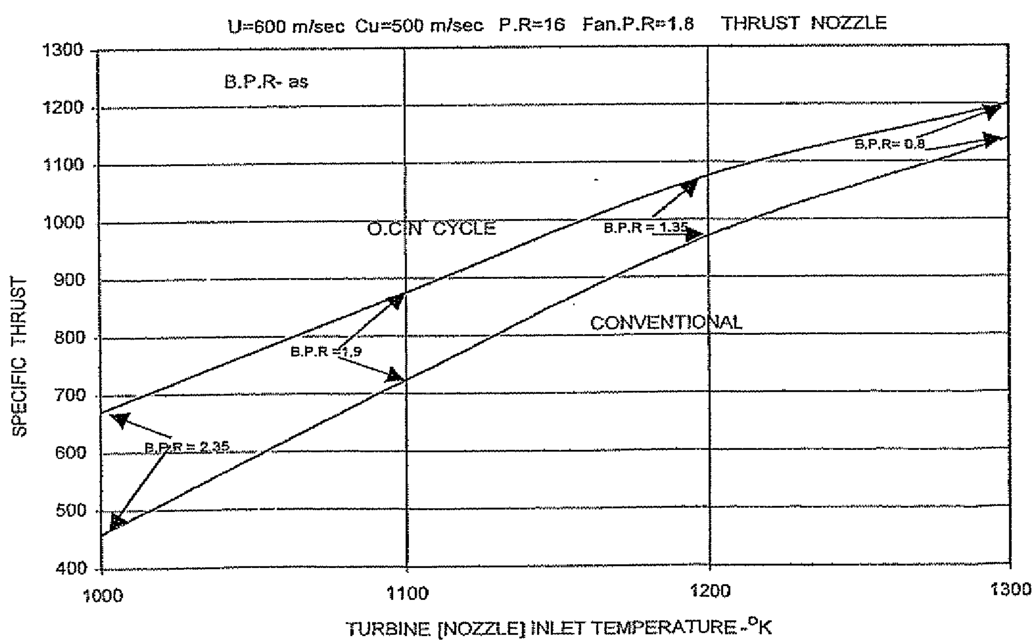


Fig. 19 – EFFECT OF PART LOAD ON THERMAL EFFICIENCY

OCN DESIGN POINT: C.P.R.=24; TURBINE INLET TEMPERATURE=1300°K; AIR FLOW=2.7 kg/sec

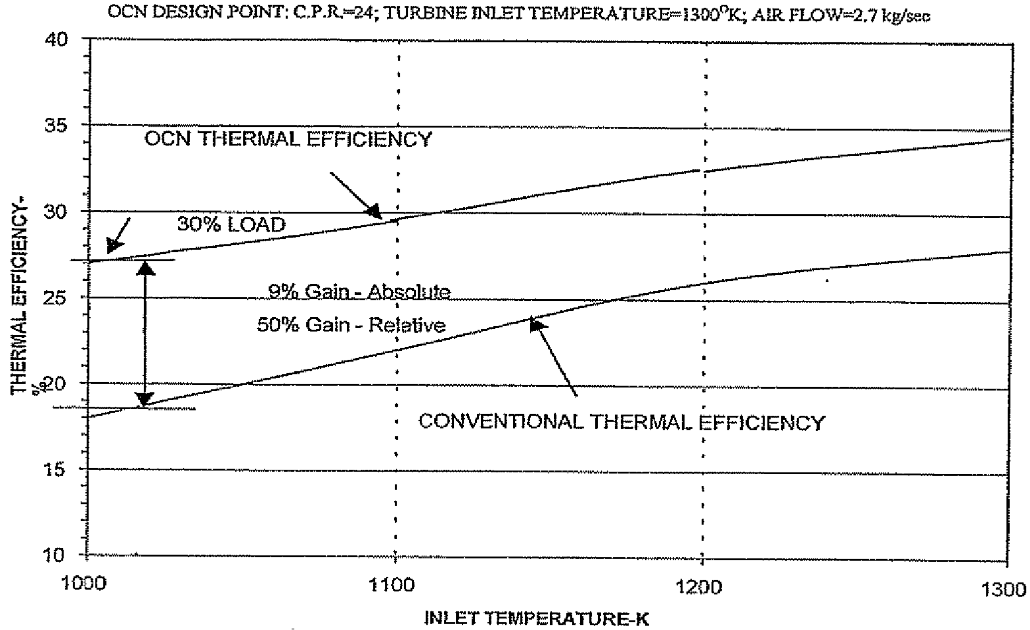


Fig. 20 EFFECT OF PART LOAD ON POWER

OCN DESIGN POINT C.P.R.=24; TURBINE INLET TEMPERATURE=1300°K; AIR FLOW=2.7 kg/sec

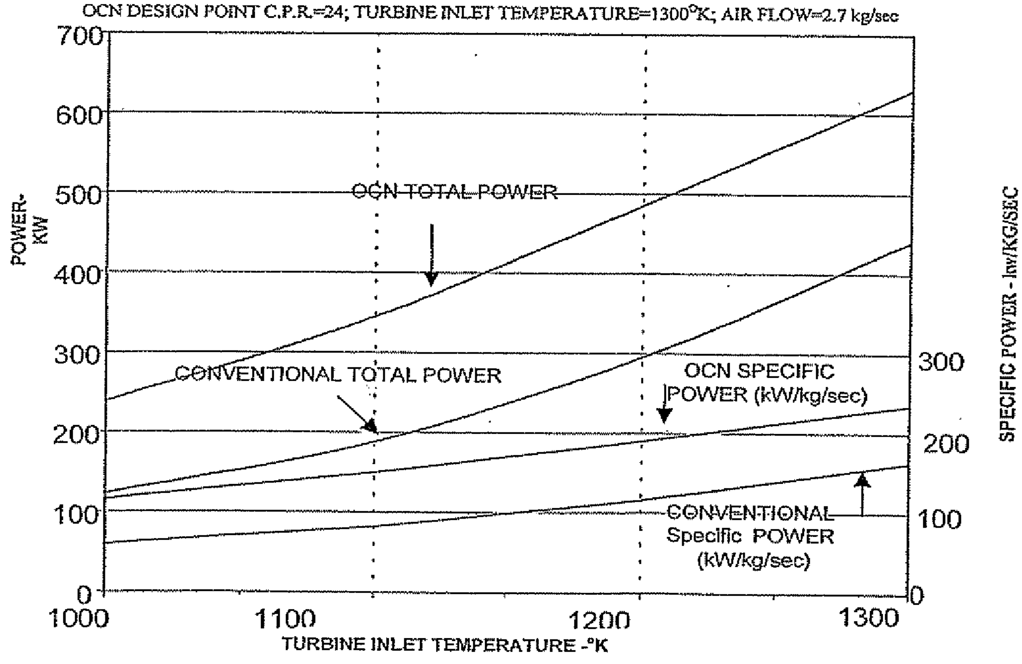
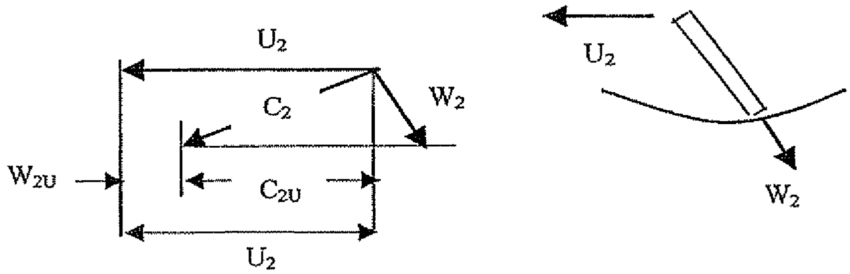


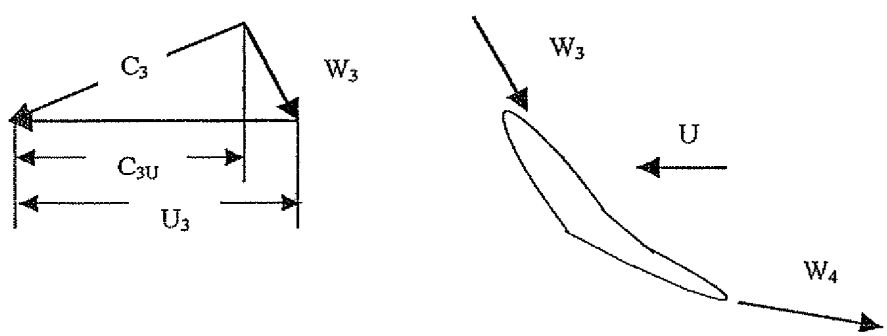
Fig 11. Velocity Triangles

$$U=U_2=U_3=U_4$$

Compressor Outlet



Turbine Inlet



Turbine Outlet

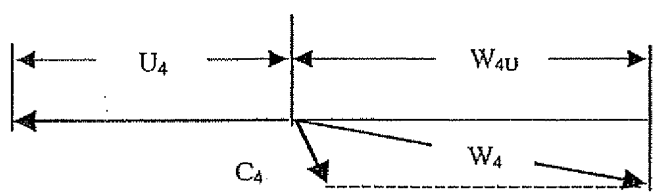


Fig. 21